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INVESTIGATION OF THE RELATION BETWEEN SYMPTOMS SEEN IN HAEMODIALYSIS PATIENTS WITH DIALYSIS ADEQUACY AND PERSONALITY TRAITS

INVESTIGACIÓN SOBRE LA RELACIÓN ENTRE SÍNTOMAS OBSERVADOS EN PACIENTES EN HEMODIÁLISIS CON LA ADECUACIÓN DE DIÁLISIS Y RASGOS DE PERSONALIDAD

İlknur Özkan[1], Seçil Taylan[2]

1) PhD, Assistant Professor, Akdeniz University, Kumluca Faculty of Health Sciences, Internal Medicine Nursing Department, Kumluca-Antalya, Turkey
2) PhD, Assistant Professor, Akdeniz University, Kumluca Faculty of Health Sciences, Surgical Nursing Department, Kumluca-Antalya, Turkey

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ABSTRACT

Objectives: Investigate the relation between the symptoms seen in haemodialysis patients with haemodialysis adequacy and character traits. **Background:** Investigation of the factors affecting symptoms seen in haemodialysis patients would lead to better understanding of the causes behind the symptoms and enable efficient symptom control management. **Design:** This descriptive and analytical study was conducted between January and June 2019 at two dialysis centres in Turkey. **Methods:** The data was collected through the Demographic Information Form, The Dialysis Symptom Index, the Big Five Inventory and by calculating Kt/V and URR (Urea Reduction Rate) values for dialysis adequacy. **Results:** It was found that 77.6% of the haemodialysis patients experience 6 or more symptoms and the most common symptoms are feeling tired or lack of energy (70.7%), and the most severe symptom is numbness or tingling in feet (3.13 ± 3.12). While 70.9% of the participants' Kt/V value was calculated as above 1.4 no statistically significant relation was found between Kt/V value and psychological and physiological symptoms ($p>0.05$). It was determined that haemodialysis patients with high neuroticism trait experience increased symptoms of tiredness, irritability, sadness, worrying; and patients with extraversion trait experience these symptoms less severely ($p<0.05$). **Conclusion:** Although this study found a relation between experienced symptoms and personality traits (neuroticism, extraversion) no relation was observed with dialysis adequacy. Nurses need to plan nursing initiatives by considering not only the patients' biochemical parameters but also their personality traits in managing haemodialysis symptoms of the patients.

KEYWORDS: haemodialysis; renal dialysis; personality traits; dialysis adequacy; symptoms

RESUMEN

Objetivos: Se investigó la relación entre los síntomas detectados en pacientes en hemodiálisis con la adecuación de diálisis y rasgos de

personalidad. **Antecedentes:** El estudio de los factores que afectan los síntomas observados en los pacientes en hemodiálisis ayudaría a entender mejor las causas detrás de dichos síntomas y permitiría un mejor manejo del control de estos. **Diseño:** El presente estudio descriptivo y analítico se desarrolló entre enero y junio de 2019 en dos centros de diálisis en Turquía. **Material y métodos:** Los datos se obtuvieron a través del formulario de información demográfica, índice de síntomas dialíticos, el modelo de los cinco grandes, y se calcularon los valores de Kt/V y tasa de reducción de urea (TRU) para la adecuación de diálisis. **Resultados:** Se encontró que el 77,6% de los pacientes de hemodiálisis experimentan 6 o más síntomas; los síntomas más comunes son cansancio o falta de energía (70,7%), y el síntoma más grave es entumecimiento u hormigueo en los pies (3,13 ± 3,12). Si bien se determinó que el cálculo del valor Kt/V del 70,9 % de los participantes fue superior a 1,4, no se encontró una relación estadísticamente significativa entre el valor de Kt/V y los síntomas psicológicos y fisiológicos (p> 0,05). Se observó que los pacientes de hemodiálisis con alto rasgo de neurosis experimentan síntomas aumentados de cansancio, irritabilidad, tristeza, preocupación; y los pacientes con rasgo de extraversión desarrollan estos síntomas con menos gravedad (p <0,05). **Conclusión:** Aunque este estudio halló una relación entre los síntomas experimentados y los rasgos de personalidad (neurosis, extraversión), no se observó relación con la adecuación de la diálisis. Es necesario que el personal de enfermería planifique iniciativas considerando no solo los parámetros bioquímicos de los pacientes, sino también sus rasgos de personalidad al lidiar con los síntomas de hemodiálisis.

PALABRAS CLAVE: hemodiálisis; diálisis renal; rasgos de personalidad; adecuación de diálisis; síntomas

1. INTRODUCTION

Haemodialysis causes major changes in patients' daily lives due to many physical and psychological symptoms such as dietary and liquid limitations and compulsory visits at the haemodialysis centres.[1-3] The most commonly reported symptoms experienced by haemodialysis patients are fatigue, pain, muscle cramps, nausea, vomiting, constipation, diarrhoea, itchiness, dry skin, sleep disorders, emotional and sexual dysfunctions.[2,4-5] The frequency and severity of these symptoms exhibit individual differences.[3-4,6-9] As the frequency and the severity of the symptoms increase, patients start to feel hopelessness and unstably toward future and experience disruptions in their quality of life .[1,2,4,9]

It is reported that 35-50% of haemodialysis patients experience four to ten symptoms, and 25-35% of them experience more than ten symptoms.[4] Another study found that the 11 symptoms seen in end stage kidney failure were as common as those experienced by patients with four chronic diseases, chronic obstructive lung disease, heart disease, AIDS and late stage cancer patients.[5] Although, they show similarities with symptoms experienced by cancer patients, symptoms in haemodialysis patients are not recognized as early as in cancer patients.[3,5,9] This might delay the treatment and care of the symptoms. Thus, symptom management is also crucial in haemodialysis patients. Symptom management requires a multi-disciplinary approach. Major role falls on nurses for reducing the severity of the symptoms and resolving them. It is of utmost importance for the nurses to be aware of the existence and severity of haemodialysis patients' symptoms in order to enable symptom management. Symptom management in haemodialysis patients should consider individuals' socio-demographic features, disease characteristics, haemodialysis adequacy and personality traits as well as psychological factors.[2]

Evaluation of haemodialysis adequacy has a critical role in clinical practices. Hence, a series of haemodialysis adequacy indices are used in studies and clinical settings.[2,10-11] One of the most frequently used dialysis adequacy

measurement method is the urea kinetic model (Kt/V) developed by Daugirdas and it can be personalized for all patients as a scale of haemodialysis adequacy. The K in Kt/V is the dialyzer clearance, t is the dialysis duration, V is the urea distribution volume.[12] Studies have shown that high (>1.2) Kt/V value is associated with longer life span, less complication and better quality of life.[10-11,13] The Big Five personality traits (neuroticism, extraversion, openness to experience, agreeableness, conscientiousness) define individual permanent and inter-culturally valid characteristics that are known to influence unlimited number of health results such as disease load and health behaviour.[14-15] Generally, agreeableness, openness to experience and conscientiousness is associated with good health perception, and neuroticism is associated with bad health perception.[14,16-19] Previous studies conducted with haemodialysis patients showed that patients with high agreeableness, openness to experience and conscientiousness traits can better maintain their self-discipline and more easily adapt to dialytic treatment.[19-20] On the other hand, patients with neuroticism trait have difficulty in sustaining motivation, usually give up before completing jobs, expect to be encouraged to achieve goals and thus, have lower adaptation rate to the treatment.[17,19-20] Neuroticism was also found to be the sole predictor of depression symptoms in dialysis patients.[16,18] Studies conducted on the factors affecting symptoms of haemodialysis patients are mostly limited to demographic and clinical features. No study was found in the literature focusing on the relation between the physical and psychological symptoms experienced by haemodialysis patients and their personality traits. Investigation of the impact of other relevant factors on symptoms on haemodialysis patients will contribute to better understanding of symptom burdens and effective symptom management. This study is significant owing to the fact that it is one of the first studies to investigate the relation between personality traits, haemodialysis adequacy and symptoms of haemodialysis patients.

2. METHOD

2.1. Aim

This study was conducted in order to investigate the relation between symptoms seen in haemodialysis patients with haemodialysis adequacy and personality traits.

2.1. Design

This descriptive cross-sectional study was conducted at two dialysis centres in Turkey between January and June 2019.

2.2. Sample/participants

Without any sampling, all patients who volunteered to participate in the duration of the study who are 18 and above; have been receiving haemodialysis treatment for minimum six months; are using arteriovenous fistula; and do not have any communication problems. Patients who use central venous catheter and arteriovenous graft were not included in the study. Thus, a total of 103 patients participated in the study.

2.3. Data collection

The data for the study were collected through the Demographic Information Form, the Dialysis Symptom Index, The Big Five Inventory as well as calculation of Kt/V and URR (Urea Reduction Rate) values for dialysis adequacy. Researchers collected data face-to-face while patients were receiving haemodialysis after informing them about the study. The data collection for each participant lasted for about 25-30 minutes including filling in the forms, getting laboratory values from patients' records and weight measurements.

2.3.1. Demographic Information Form

This form was developed by the researchers based on the review of relevant literature.[6-8,10,12] The Demographic Information Form consisted of ten questions about descriptive features of haemodialysis patients; 11 questions on their background and parameters regarding pre- and post-dialysis BUN values, patients' weights, and duration of dialysis.

2.3.2. The Dialysis Symptom Index

The Dialysis Symptom Index was developed by Weisbord *et al*. (2004) in order to evaluate the physical and emotional symptoms and their severity. DSI consists of 30 symptoms each of which targets either a physical or emotional indicator. The symptoms experienced in the last seven days are indicated as yes-no; if yes, to what extent it bothered was rated in 5-point Likert-type: 1= not at all, 2= a little bit, 3= somewhat, 4= quite a bit, 5= very much. The Turkish adaptation of DSI along with its validity and reliability was conducted by Önsöz, Usta Yeşilbalkan (2013) who found the Cronbach Alpha Coefficient as 0.83.[21] The Cronbach Alpha Coefficient in this study was calculated as 0.86.

2.3.3. The Big Five Inventory

The Big Five Inventory (BFI), developed by John, Donahue and Kentle (1991), is a short scale measuring the prototypical components of five major dimensions. It is a 5-point Likert-type scale consisting of five major dimensions: extraversion (8 items); agreeableness (9 items), conscientiousness (9 items), neuroticism (8 items) and openness to experience (10 items). Items 2, 6, 8, 9, 12, 18, 21, 23, 24, 27, 31, 34, 37, 41 and 43 are reversely coded (John and Srivastava, 1999). The Turkish validity of the scale was done by Sümer, Lajunen and Özkan (2005). The Cronbach Alpha Coefficients of the sub-dimensions in the Turkish validity ranged between 0.66 and 0.77.[22] For this study, it was found that the Cronbach Alpha Coefficients ranged between 0.70 and 0.76.

2.3.4. Dialysis adequacy

Kt/V and URR values were used for dialysis adequacy. Kt/V values was calculated by using Daugirdas formula:[12]

Kt/V= -log (Upost/Upre-0,008t) + (4-3,5 Upost/Upre) x (Wpre-Wpost)/Wpost
Upost= Post-haemodialysis BUN
Upre= Pre-haemodialysis BUN
Wpost= Post-haemodialysis weight
Wpre= Pre-haemodialysis weight
t= HD duration
URR= (Upre-Upost/Upre) x 100

2.4. Ethical consideration

Prior to the study, approval was received from Akdeniz University Clinical Studies Ethics Board (protocol nº 2012/KAEK/20-599 -29.08.2018) and written permission was collected from the institutions where the study will be conducted Individuals who accepted to participate in the study also provided their written informed consent.

2.5. Data analysis

The statistical analysis of the data was done through SPSS 21.0 statistical package software. Descriptive statistical methods (frequency, percentile, and standard deviation, mean) were used to analyse the collected. Binary logistics regression analysis was used to evaluate the BIF dimensions, Kt/V URR values and some descriptive variables (age, gender, dialysis year) that might influence haemodialysis symptoms. The findings were assessed within 95% confidence interval and at p<05 significance level.

3. FINDINGS

3.1. Demographic features

The findings showed that the mean age of haemodialysis patients was 60.07 ± 12.50; 68.0% were male, 68.9% were graduates of primary education, 81.6% were married, 92.2% were unemployed, 69.9% were living in the town, and 88.3% had social security. It was also found that 38.8% of the patients who started haemodialysis had diagnosis of diabetic nephropathy, 67.0% have a minimum of one additional disease, 95.1% receive dialysis 3 times a week and 30.1% were receiving haemodialysis for 5-10 years (5,78 ± 5,07). **(Table 1)**
It was calculated that the mean of patients' Kt/V values was 1.51 ± .32 and URR value mean was 71.60 ± 7.66. Out of all participants, 70.9% had Kt/V value above 1.4, and 87% had URR value of above 65%**. (Table 1)**

Table 1. Demographic features

Characteristics		**n (103)**	**% (100)**
Gender	Female Male	33 70	32.0 68.0
Age 60.07 ± 12.50	18-44 45-54 55-64 65-74 >75	9 23 32 30 9	8.7 22.3 31.1 29.1 8.7
Education	Illiterate Literate Primary school Secondary school University	14 9 71 6 3	13.6 8.7 68.9 5.8 2.9
Marital Status	Married Single	84 19	81.6 18.4
Working at work	Yes No	8 95	7.8 92.2
Living location area	Province Town Village	6 72 25	5.8 69.9 24.3
Health Insurance Status	Yes No	91 12	88.3 11.7
First Diagnosis	Chronic Glomerulonephritis Hypertensive Kidney Disease Pyelonephritis Diabetic Nephropathy Polycystic Kidney Disease	14 30 2 40 17	13.6 29.1 1.9 38.8 16.5
Existence of Additional Disease	Yes No	69 32	67.0 33.0
Number of Haemodialysis Per Week	2 session 3 session 4 session	2 98 3	1.9 95.1 2.9
Years of Haemodialysis 5.78 ± 5.07	<5 years 5-10 years >10 years	54 31 18	52.4 30.1 17.5
Kt/V 1.51 ± .32	<1.2 1.2-1.4 >1.4	5 25 73	4.3 24.3 70.4
URR 71.60 ± 7.66	>%65 Other value	87 16	84.5 15.5

3.2. Distribution of patients' Big Five Inventory (BIF) score mean with existence of symptom and severity of the symptom

The BIF score mean for extraversion, agreeableness, conscientiousness, neuroticism, openness to experience sub-dimensions are 25.61 ± 3.58, 27.63 ± 4.34, 27.44 ± 4.24, 25.35 ± 3.65, 31.97 ± 5.54, respectively. **(Table 2)**

Table 2.a. Distribution of patients' Big Five Inventory (BIF) score mean with existence of symptom and severity of the symptom

Bıg Fıve Inventory (BIF)	**X±SS**	
Extraversion	25.61 ± 3.58 (17-35)	
Agreebleness	27.63 ± 4.34 (18-39)	
Conscientiousness	27.44 ± 4.24 (18-38)	
Neuroticism	25.35 ± 3.65 (15-36)	
Openness	31.97 ± 5.54 (20-60)	
Number of Symptoms	**n**	**%**
1-5 symptoms	23	22.3
6-10 symptoms	34	33.0
11-15 symptoms	23	22.3
16-22 symptoms	23	22.3

The least common symptom was be vomiting (10.7%) and the most common symptom was feeling tired or lack of energy (70.7%). A cut point was determined between the least common percentage and the most common percentage of symptoms through a simple mathematical formula (10.7+70.7)/2). As a result of the calculation, symptoms with more than 44.2% commonality were acknowledged as the most common symptoms. It was determined that the most commonly experienced symptoms by patients were feeling tired, lack of energy, (77.7%; 2.97 ± .77), decreased interest in sex (55.3%; 2.94 ± .74), difficulty becoming sexually aroused (54.4%, 2.78 ± .84), muscle cramps (54.0%, 2,79 ± ,71), feeling nervous (51.5%, 2.64 ± .76), feeling sad (47.6%, 2.69±.68), feeling anxious (47.6%; 2.67 ± .79), and difficulty falling asleep (47.6%, 2.83 ± .62) **(Table 2)**. It was determined that 77.6% of the patients experienced six or more symptoms.

Table 2.b. Severity of the symptom

Dialysis Symptom Index (DSI)	Presence of Symptoms		Symptom Severity
	No n(%)	Yes n (%)	X±SS
1. Constipation	77(74.8)	26(25.2)	2.80 ± .63
2. Nausea	83(80.6)	20(19.4)	2.30 ± .86
3. Vomiting	92(89.3)	11(10.7)	2.72 ± 1.01
4. Diarrhea	90(87.4)	13(12.6)	2.46 ± .51
5. Decreased appetite	72(69.9)	30(29.1)	2.43 ± .56
6. Muscle cramps	49(47.6)	54(52.4)	2.79 ± .71
7. Swelling in legs	81(78.6)	22(21.4)	2.22 ± .43
8. Shortness of breath	83(80.6)	19(18.4)	2.57 ± .69
9. Light headedness/dizziness	68(66.0)	35(34.0)	2.68 ± .67
10. Difficulty keeping legs still	80(77.7)	23(22.3)	2.47 ± .59
11. Numbness or tingling in feet	60(58.3)	44(42.7)	3.13 ± 3.12
12. Feeling tired or lack of energy	23(22.3)	80(77.7)	2.97 ± .77
13. Cough	72(69.9)	31(30.1)	2.22 ± .80
14. Dry mouth	61(59.2)	42(40.8)	2.47 ± .67
15. Bone or joint pain	72(69.9)	31(30.1)	2.48 ± .72
16. Chest pain	84(81.6)	19(18.4)	2.31 ± .67
17. Headache	80(77.7)	23(22.3)	2.34 ± .71
18. Muscle soreness	78(75.7)	25(24.3)	2.36 ± .70
19. Difficulty concentrating	84(81.6)	19(18.4)	2.36 ± .89
20. Dry skin	63(61.2)	40(38.8)	2.40 ± .70
21. Itching	60(58.3)	44(42.7)	2.77± .79
22. Worrying	67(65.0)	36(35.0)	2.69 ± .78
23. Feeling nervous	50(48.5)	53(51.5)	2.64 ± .76
24. Feeling sad	54(52.4)	49(47.6)	2.69 ± .68
25. Trouble staying asleep	60(58.3)	44(42.7)	2.89 ± .56
26. Feeling irritable	68(66.0)	35(34.0)	2.45 ± .81
27. Trouble falling asleep	54(52.4)	49(47.6)	2.83 ± .62
28. Feeling anxious	54(52.4)	49(47.6)	2.67 ± .79
29. Decreased interest in sex	46(44.7)	57(55.3)	2.94 ± 74
30. Difficulty becoming sexually aroused	47(45.6)	56(54.4)	2.78 ± .84

3.3. Evaluation of the relation between dialysis symptoms with dialysis adequacy and personality traits via logistic regression analysis

The predictors for the most common symptoms in haemodialysis patients were found via logistic regression analysis by means of Wald method, URR and Kt/V values as predictors of age, gender, year of dialysis, dialysis adequacy and by including BIF sub-dimensions, the best model for falling asleep and feeling sad symptoms were found in the first model and for other symptoms, it was found in the 2nd model. URR and Kt/V values were not found in any of the models. **(Table 3)**

Table 3. Evaluation of the relation between dialysis symptoms with dialysis adequacy and personality traits via logistic regression analysis

	Independent variables	β	**SE**	**Wald**	**p**	**OR**	**%95 CI**	
[1] **Feeling tired or lack of energy**	Constant	1.657	.633	6.857	.009**	5.242	-	-
	Gender (Male)	-1.540	.688	5.009	.025*	.214	.056	.826
	Extraversion	-2.201	1.094	4.047	.044*	.135	0.96	.912
	Neuroticism	1.576	.584	7.293	.007**	4.836	1.541	15.182
[2] **Decreased interest in sex**	Constant	-1.448	.511	8.032	.005**	.235		
	Gender (Male)	1.527	.478	10.222	.001**	4.603	1.805	11.735
	Year of Haemodialysis	.113	.049	5.446	.020*	1.120	1.018	1.232
[3] **Difficulty becoming sexually aroused**	Constant	-1.635	.530	9.513	.002**	.195	-	-
	Gender (Male)	1.691	.490	11.886	.001**	5.425	2.074	14.186
	Year of Haemodialysis	.118	.049	5.762	.016*	1.126	1.022	1.240
[4] **Muscle cramps**	Constant	-1.929	1.080	3.190	.044*	.145	-	-
	Age	.045	.019	5.885	.015*	1.046	1.009	1.085
	Gender (Male)	-.976	.471	4.297	.038*	.377	.150	.948
[5] **Feeling nervous**	Constant	-1.730	.531	10.597	.001**	.177	-	-
	Extraversion	-1.720	.676	6.466	.011*	.315	0.96	.912
	Neuroticism	2.139	.529	16.346	.000**	8.491	3.010	23.951
	Year of Haemodialysis	.115	.050	5.371	.020*	1.122	1.018	1.236
[6] **Feeling sad**	Constant	-.827	.320	6.656	.011*	.438	-	-
	Extraversion	-1.232	.617	3.990	.046*	.364	.150	.948
	Neuroticism	1.312	.451	8.455	.004**	3.714	1.534	8.995
[7] **Trouble falling asleep**	Constant	-3.856	1.569	6.041	.014*	.021	-	-
	Extraversion	.147	.061	5.850	.016*	1.158	1.028	1.304
[8] **Feeling anxiety**	Constant	-1.157	.346	11.213	.001**	.314	-	-
	Extraversion	-1.446	.679	3.904	.044*	.244	.150	.948
	Neuroticism	1.543	.467	10.908	.001**	4.679	1.873	11.692

*p<0.05 **p<0.01 **CI:** confidence interval. **OR:** odds ratio. **SE:** Standart Error

[1] The most significant model was formed in step 2.Nagelkerke R^2:0.233. Model: x^2= 17.035 p= 0.001

[2] The most significant model was formed in step 2.Nagelkerke R^2:0.119. Model: x^2= 15.850 p= 0.000

[3] The most significant model was formed in step 2.Nagelkerke R^2:0.216. Model: x^2= 18.163 p= 0.000

[4] The most significant model was formed in step 2.Nagelkerke R^2:0.112. Model: x^2= 9.065 p= 0.011

[5] The most significant model was formed in step 2.Nagelkerke R^2:0.254. Model: x^2= 21.769 p= 0.000

[6] The most significant model was formed in step 1.Nagelkerke R^2:0.123. Model: x^2= 10.000 p= 0.007

[7] The most significant model was formed in step 1.Nagelkerke R^2:0.080. Model: x^2= 6400 p= 0.011

[8] The most significant model was formed in step 2.Nagelkerke R^2:0.160. Model: x^2= 12.913 p= 0.002

The model estimated that on average the odds of the feeling tired and without energy increases 4.83 times more in neuroticism than in those that are not (CI: .056-.826). It was determined that patients with extroversion experience 86,5% less tiredness and lack of energy symptom (Nagelkerke R^2: 0.233. Model: x^2= 17.035, p= 0.001).

The model estimated that on average the odds of the decreased interest in sex symptom are experienced 4,603 times more by men than women (CI: 1.805-11.735). This model estimated that on average the odds of lower sexual interest increase 12% per year of hemodialysis (Nagelkerke R^2: 0.119. Model: x^2= 15.850, p= 0.000).

The model estimated that on average the odds of the difficulty becoming sexually aroused symptom is experienced 5,425 times more by men than women (CI: 2.074-14.186). This model estimated that on average the odds of lower difficulty becoming sexually aroused increase 12.6% per year of hemodialysis (Nagelkerke R^2: 0.216. Model: x^2= 18.163, p= 0.000).

The model estimated that on average the odds of the *muscle cramps symptom*, is experienced 1.046 times with each unit of increase in age (CI: 1.009-1.085). Men experienced this symptom 62.3% more than women (Nagelkerke R^2: 0.112. Model: x^2= 9.065, p= 0.011).

The model estimated that on average the odds of the feeling nervous symptom was experienced 4.836 times with each unit of increase in neuroticism (CI: 3.010-23.951) and 1.122 times with each unit of haemodialysis year (CI: 1.018-1.236). It was found that extroverted patients experienced 68.35% less nervousness (Nagelkerke R^2: 0.254. Model: x^2= 21.769, p= 0.000).

The model estimated that on average the odds of the symptom of feeling sad is experienced 4.429 times by an increase of one unit in neuroticism (CI: 1.534-8.995). Extraverted patients were found to experience 63.6% less sadness (Nagelkerke R^2: 0.123. Model: x^2= 10.000, p= 0.007).

The model estimated that on average the odds of the s*ymptom of difficulty falling asleep were* experienced by 1.158 times with one unit is rise in extraversion trait (Nagelkerke R^2: 0.080. Model: x^2= 6400, p= 0.011, CI: 1.028-1.304).

The model estimated that on average the odds of the symptom of feeling anxiety is experienced 4.679 times with every unit of increase in neuroticism (CI: 1.873-11.692). Extraverted patients were found to experience 75.6% less sadness (Nagelkerke R^2: 0.160. Model: x^2= 12.913, p= 0.002).

4. DISCUSSION

It is important to examine the physical and emotional symptoms experienced by haemodialysis patients and the factors influencing them in order to maintain effective symptom management. This study examined the relation between haemodialysis adequacy and personality traits with symptoms experienced by haemodialysis patients.

The most common experienced symptoms by haemodialysis patients are feeling tired/lack of energy, decreased interest in sex, difficulty becoming sexually aroused, muscle cramps, feeling nervous, feeling sad, and feeling anxiety, difficulty falling asleep, respectively. Feeling tired is indicated as the most common symptom in haemodialysis patients[1,3,16] yet, other symptoms' existence and severity show differences.[7,9,23] The frequency and severity of symptoms might show differences but the fact is that both in this study and the previous studies it was found that patients suffer from a high number of symptoms.[1,3,9] Nurses being aware of the symptoms that might be seen in haemodialysis patients and their severity would increase patients' quality of life by enabling effective symptom management and arrangement of nursing practices accordingly.

The predictors of the most common symptoms in the study were examined via logistic regression analysis; and the results determined male gender, age, haemodialysis years, extraversionness, and neuroticism. URR and Kt/V values were not located in any of the models.

It was found that male haemodialysis patients experience tiredness and muscle cramps less compared to female patients. The majority of the studies also reported that male patients

experience lower symptom load and severity as compared to female patients.[6-8,24] Yet, some studies found no relation among tiredness, muscle cramps and gender. [1,4,25] It is noted in this study that male patients experience decreased sexual interest and difficulty becoming sexually aroused symptoms more severely. The sexual problems showed differences according to gender in studies investigating sexuality in haemodialysis patients. [7,24] While dissatisfaction and nonsensuality is high in women, avoidance is high in men. The reasons benign avoidance is suggested to be related to the gynaecomastia in 30% of women and erectile dysfunction in 72% of men.[24]

It was reported that muscle cramps increase with age in haemodialysis patients. However, some studies, different from this study, found no difference due to age and symptoms experienced. [6-8] However, it is believed that an objective assessment is hindered as the symptom studies on haemodialysis patients use the total symptom index score to compare socio-demographic data.

The decreased interest in sex, difficulty becoming sexually aroused and feeling nervous symptoms increase as the years of haemodialysis increases. The relation between haemodialysis duration and the experienced symptoms show differences.[4,6-7,24] Similarly, another study reported that patients dissatisfaction and avoidance in sexual interest symptoms increase with longer haemodialysis durations.[24] Yet, certain studies found no relation between haemodialysis duration and experienced symptoms.[4,6-7,26]

The findings showed that patients with high neuroticism experience increased tiredness, feeling nervous, feeling sad, and feeling anxious symptoms. No study was found investigating the relation between tiredness in haemodialysis patients and their personality traits. In the 6-month follow-up study conducted with women with breast cancer and benign breast problems (n=304), neuroticism was found to be in a stronger relation with tiredness than demographic features, cancer diagnosis period, and cancer treatment method.[17] Studies have reported that people with high neuroticism have worse health results[19] worse health perception [14-15] and lower quality of life.[20] Other studies on haemodialysis patients also found neuroticism as associated with low mental life quality and a significant predictor of depression symptoms.[16,18,20,27] Individuals with high neuroticism are potentially more sensitive toward negative stimuli. Thus, it is not surprising to find that patients with high neuroticism experience nervousness, sadness, anxiety, and tiredness more severely. Nurses need to be aware that patients with high neuroticism require more support for symptom management and plan their nursing initiatives accordingly.

The study found that patients with high extraversionness experienced decreased symptoms of tiredness, feeling nervous, feeling sad, and feeling anxiety. In parallel to our findings, studies conducted with various chronic patients, also reported that high extraversionness is in a negative relation with tiredness.[7,19] Studies have conveyed that high extraversionness is related with better health results.[14,19,27- 28] Studies conducted with chronic kidney failure patients showed that high extraversionness is related with better mental quality of life.[27-28] It is possible that patients with high extraversion express themselves more clearly, cooperate with healthcare professionals regarding their disease management and use management techniques more efficiently; thus, decrease the severity of tiredness, nervousness, sadness and anxiety symptoms.

Previous studies have mostly focused on the relation of dialysis adequacy with biochemical parameters and studies focusing on quality of life, physical and psychological symptoms remained quite limited.[29-30] Some studies have found a relation between Kt/V value and quality of life and depression.[10-11,13] This study did not identify any relation between Kt/V value and other symptoms. Although almost all the patients had desired levels of Kt/V values, more than half of them experienced over six symptoms. These findings prove that, dialysis adequacy evaluation should not only consider biochemical parameters but also the symptoms experienced

by the patients.

4.1. Limitations of the study

The study group consists of a heterogeneous sample based on first disease diagnosis, existence of additional diseases, time to start haemodialysis. Also, participants' depression and anxiety levels have not been measured and these variables were not assessed as controlling variables. These issues can be listed as the limitations of this study. In addition to this, it has a strength as it is one of the first studies to investigate the relation between the Big Five personality traits and symptoms experienced in regard to haemodialysis.

5. CONCLUSION

It was found in the study that although almost all the patients have desired Kt/V and URR values, most of the haemodialysis patients experience six or more symptoms. While a relation was found among the symptoms experienced by haemodialysis patients and age, gender, haemodialysis period and personality traits; no relation was found with haemodialysis adequacy. It was also observed that haemodialysis patients with high neuroticism trait exhibit more symptoms; whereas, patients with high extraversion trait experience fewer symptoms.

Nurses are health professional who play a key role in symptom management during haemodialysis and it is important for them to use their nursing roles effectively and accurately. Personality traits need to be considered as a significant psychological parameter contributing to the development of effective nursing initiative strategies. Nurses and other health professionals should be aware that patients with high neuroticism are inclined to exaggerate and catastrophize disease and treatment symptoms, can get angry more easily, have more difficulty in implementing management strategies, experience more anxiety and sadness regarding the treatment and disease.

Since the studies investigating the relation between personality traits of haemodialysis patients and symptoms, it is suggested to replicate this study with larger sample groups. Similar to this study's finding, majority of the studies in the literature also identified tiredness as the most commonly seen symptom in haemodialysis patients. In the study, tiredness dramatically increased in patients with high neuroticism. Additionally, it is suggested to examined the relation between tiredness and neuroticism by including new variables, as it can provide insights into the reasons underlying tiredness and not only physiological causes.

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Dr. İlknur Özkan
Akdeniz University, Kumluca Faculty of Health Sciences, Internal Medicine Nursing Department, Kumluca-Antalya, Turkey
ORCID: 0000-0002-0826-5682
e-mail: ilknurozkan@akdeniz.edu.tr